

AMENDMENT UNDER 37 C.F.R. § 1.116
U.S. Patent Application No. 09/633,336

AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions and listings of claims in the application:

LISTING OF CLAIMS:

1. (Currently amended) A method for manufacturing a pneumatic tire in which a green tire having tire components assembled is charged in a mold for vulcanization-molding and lug grooves are formed on a tire tread surface within the mold by lug groove ribs provided on an inner surface of the mold, the mold having an upper mold part and a lower mold part; said method comprising the steps of:

previously forming carved grooves at positions on a tread surface of said green tire corresponding to said lug grooves such that the carved grooves extend in substantially the same direction as said lug grooves and such that each of the carved grooves has substantially a triangular shape that widens gradually from a side of a tread center to a side of a tread end; and

inserting ~~at least one~~ of the lug groove ribs into a corresponding carved groove formed on said tread surface of the green tire while rotating one of the upper mold part and the lower mold part relative to the green tire through an angle corresponding to an angle between a longitudinal axis of the carved groove and an axis of the tire.

2. (Original) A method for manufacturing a pneumatic tire as claimed in claim 1, wherein said carved groove is carved in a shape opened from a tread center side to a tread end.

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3. (Original) A method for manufacturing a pneumatic tire as claimed in claim 2, wherein said carved groove is carved in a shape opened from a neighborhood of a closed end point of said lug groove to said tread end.

4. (Original) A method for manufacturing a pneumatic tire as claimed in claim 3, wherein said closed end point of said lug groove is distant from a tread center by a distance larger than 0.1 times of a tread width.

5. (Currently amended) A method of manufacturing a pneumatic tire as claimed in claim 1, wherein a main part of said lug groove is inclined with regard to the axis of the tire at an angle of 5 degrees and more and 45 degrees and less.

6. (Original) A method of manufacturing a pneumatic tire as claimed in claim 1, wherein said carved groove is carved in a shape opened from one tread end to another tread end.

7. (canceled)

8. (Previously presented) A method for manufacturing a pneumatic tire as claimed in claim 1, wherein said carved groove having the shape gradually widening is formed by carrying out the carving twice using a cutter.

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9. (Currently amended) A method for manufacturing a pneumatic tire as claimed in claim 6, wherein said carved groove is carved along a direction of said lug groove and along a direction of the axis of the tire from or toward a neighborhood of said closed end point of said lug groove.

10. (Currently amended) A method of manufacturing a pneumatic tire as claimed in claim 1, wherein a volume of said carved groove is 0.4 - 1.2 times ~~of~~ a volume of said lug groove.

11. (Currently Amended) A method of manufacturing a pneumatic tire as claimed in claim 10, wherein the volume of said carved groove is 0.7 - 1.0 times ~~of~~ the volume of said lug groove.

12. (Currently amended) A method of manufacturing a pneumatic tire as claimed in claim 10, wherein a depth of said carved groove is 0.5 - 0.9 times ~~of~~ a depth of said lug groove.

13. (Original) A method of manufacturing a pneumatic tire as claimed in claim 1, wherein said tire components include a belt member having a relatively low expansion rate.

14. (Currently amended) A method for manufacturing a pneumatic tire as claimed in claim 13, wherein an expansion rate of said belt member is 3% or less.

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15. (Currently amended) A method for manufacturing a pneumatic tire as claimed in claim 1, wherein a full-mold vulcanization-molding machine having ~~an~~the upper mold part and the lower mold part is used as ~~the~~the mold for vulcanizing and molding said green tire.

16. (Currently amended) A method of manufacturing a pneumatic tire as claimed in claim 15, wherein lug groove ribs on said upper and ~~said lower mold~~said lower mold parts are fitted in said carved groove of said green tire when said green tire is charged in said full-mold vulcanization-molding machine.

17. (Currently amended) A method for manufacturing a pneumatic tire, comprising:
manufacturing a green tire in which extruded rubber having the shape of a ribbon or a sheet is piled up on a ply and a belt member assembled on a drum to form a tread;
forming a carved groove on a tread surface of said green tire in direction of a lug groove;
charging said green tire formed with said carved groove in a vulcanization-molding machine to carry out vulcanization-molding so as to form a vulcanized tire having the lug groove, which is formed by a lug groove rib of the vulcanization-molding machine, the vulcanization-molding machine having an upper mold part and a lower mold part; and
inserting ~~at least one~~ of the lug groove ribs into a corresponding carved groove formed on said tread surface of the green tire while rotating one of the upper mold part and the lower mold part relative to the green tire through an angle corresponding to an angle between a longitudinal axis of the carved groove and an axis of the tire.

18. (canceled)

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19. (Currently amended) A method as claimed in claim 1, wherein said triangular shape is formed by ~~the step of~~ carving a first groove extending in a direction inclined to ~~an~~ said axis of the tire and a second groove extending substantially in parallel with said axis and partly overlapping said first groove.

20. (Currently amended) A method of manufacturing a pneumatic tire as claimed in claim 1, further comprising ~~the steps of~~:

providing said ~~mold with an~~ upper mold part and ~~a~~ said lower mold part ~~having~~ with said lug groove ribs;

relatively moving said upper mold part to said lower mold part to close said mold; and

rotating said upper mold part relative to said lower mold part while the upper mold part is moving toward said lower mold part.

21. (Currently Amended) A method for manufacturing a pneumatic tire as claimed in claim 20, wherein said step of rotating said upper mold part relative to said lower mold part is carried out with a slide guide fixed to the upper mold part being guided by a slide guide fixed to the lower mold part, wherein each of the slide guides includes a slide face which is inclined relative to the axis of the tire at an angle corresponding to the angle between the longitudinal axis of the carved groove and the axis of the tire.

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22. (New) A method as claimed in claim 17, wherein the step of rotating said upper mold part relative to said lower mold part is carried out with a slide guide fixed to the upper mold part being guided by a slide glide fixed to the lower mold part, wherein each of the slide guides includes a slide face which is inclined relative to the axis of the tire at an angle corresponding to the angle between the longitudinal axis of the carved groove and the axis of the tire.